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Atsushi Suzuki

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01/28/2009

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EXAMINER

HIGGINS, GERARD T

ART UNIT

PAPER NUMBER

1794

NOTIFICATION DATE

DELIVERY MODE

01/28/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

garycohn@seattlepatent.com

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed 12/17/2008 has been entered. Currently claims 1-20 are pending.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

On the Oath and Declaration submitted 04/25/2005 the signed name and the typewritten name for the third named inventor are not in agreement (Yoshio Yoshida vs. Tadashi Yoshida). The Examiner recognizes applicants' Remarks to this end, and notes that this objection is being restated until the new Oath and Declaration is submitted.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology

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often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because of the following statement:

"present in the ink absorbing layer such that the boundary area between particle polymers is not lost due to fusion of adjacent polymer particles." Perhaps applicants meant "present in the glossy layer such that the boundary area between particle polymers is not lost due to fusion of adjacent polymer particles." Correction is required.

See MPEP § 608.01(b). See section 7 below.

Claim Objections

5. Claim 1 is objected to because of the following informalities: the phrase "particle polymers" at the ninth and tenth lines of the claim is awkward. Perhaps applicants meant "polymer particles." Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claims 1-6 and 9-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the boundary area" in the ninth line of the claim. There is insufficient antecedent basis for this limitation in the claim.

The term "lost" in claim 1 is a relative term which renders the claim indefinite. The term "lost" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what the term lost means given the fact that applicants allow for polymer particles to be in contact or connected in spots (applicants' specification page 11, lines 12-15).

The term "small voids" in claim 1 is a relative term which renders the claim indefinite. The term "small voids" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear how small these voids must be and how many there can be in order to preserve a boundary area, but still allow for polymer particles to be in contact or connected in spots (applicants' specification page 11, lines 12-15).

Claim 1 recites the limitation "the boundary" in the eleventh line of the claim. There is insufficient antecedent basis for this limitation in the claim. Perhaps applicants meant "the boundary area."

Claim 1 recites the limitation "particles" in the eleventh line of the claim. There is insufficient antecedent basis for this limitation in the claim. Perhaps applicants meant "polymer particles."

Claim Rejections - 35 USC § 103

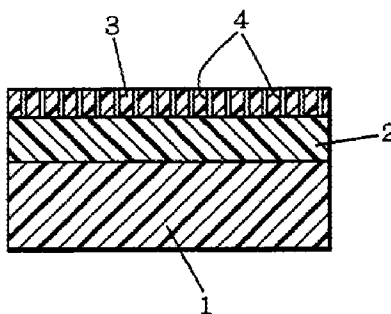
8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada et al. (6,177,181) in view of Watanabe et al. (WO 00/15552), of which US 6,632,489 is the national stage entry of the international application, and will be used as a translation.

With regard to claims 1 and 3, Hamada et al. discloses the device of Figure 1.

FIG. 1



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The device comprises a base substrate **1**, an ink-absorbing layer **2**, and a porous top layer (glossy layer) **3** (col. 12, lines 19-25). The recording sheet is especially useful in inkjet recording systems (col. 17, lines 56-60). The porous top layer comprises hydrophilic polymers, which may be the same hydrophilic polymers used in the ink-absorbing layer (col. 16, lines 25-39). Hamada et al. disclose various hydrophilic polymers useful in the ink-absorbing layer that are comprised of copolymerizable monomers at col. 12, lines 1 to col. 13, line 58. They specifically state that the monomers may be used alone or as a combination of two or more at col. 13, lines 16-17 and 56-58. Included in this list of monomers are nitrogen containing cationic monomers (col. 13, lines 6-13) of which N,N-diethylaminoethyl (meth)acrylate at col. 13, line 38 is an example of a nitrogen containing polymer that may be made cationic (additionally please see page 10, lines 8-19 of applicants' specification, which states that N,N-diethylaminoethyl (meth)acrylate is a cationic monomer), (meth)acrylamide at col. 13, lines 40-41, styrene at col. 13, line 51, and methyl methacrylate at col. 13, lines 33-35.

The porous top layer is prepared according to the process at col. 11, lines 7-51, which includes placing the polymerized monomers into a "good solvent" and a "poor solvent." These solvent have different affinities for the polymer as they are different polarities. The polymer containing solvent is then coated onto the base and is dried with the "good solvent" coming off first (col. 11, lines 13-22). As the "good solvent" evaporates the polymers form micelles (gel phase), which is equivalent to applicants' polymer dispersion because when dried it will form a dispersion of polymer particles. The dispersion of polymer particles proceeds to form a network structure comprising

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pores (col. 11, lines 19-22). Even though there is no disclosure that the porous layer is a glossy layer, given that the porous layer of Hamada et al. is identical to the presently claimed glossy layer, it is clear that the top layer of Hamada et al. would function as a glossy layer as presently claimed; furthermore, given the fact that the Examiner has shown each of the monomers of applicants' claim 1 are disclosed in Hamada et al., it is clear to the Examiner that the copolymer of Hamada et al. will intrinsically form a boundary area between polymer particles that is not lost due to fusion of adjacent polymer particles, and small voids are left in the boundary area between particles.

With regard to the ink absorbing layer, it may comprise the same hydrophilic polymers for the glossy layer, or it may comprise a simple vinyl alcohol binder (col. 12, line 32 to col. 13, line 58); additionally, it may be comprised of the inorganic particles (pigments) disclosed at col. 15, lines 40-59; however, Hamada et al. fail to disclose the average particle diameter of the inorganic particles in the ink absorbing layer.

Watanabe et al. disclose rosary (moniliform) shaped spherical colloidal silica, which is comprised of particles having a secondary diameter of 50 to 500 nm (D_1) and a primary diameter of 10 to 80 nm (D_2 , col. 4, lines 7-34). The particles are measured using dynamic light scattering method and BET methods, and typically Watanabe et al. express the particles as a ratio of D_1/D_2 , which represents the amount of linking (coagulation) that occurs (col. 6, lines 16-22).

Since Hamada et al. and Watanabe et al. are both drawn to ink receiving layers for inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the pigments of Hamada et al. with

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the moniliform spherical colloidal silica of Watanabe et al. The results of such a substitution would have been predictable to one having ordinary skill in the art. The motivation for doing so can be found at col. 11, lines 42-49 of Watanabe et al., where they state that ink receiving layer comprised of their inventive silica and a binder will result in increased ink absorption, fast absorption speed, and an improved color development or ink.

With regard to claim 2, Hamada et al. do not explicitly state the particle sizes of their dispersion particles for the glossy layer; however, they do state the pore sizes and the transmission of light at 400 nm at col. 16, line 48 to col. 17, line 7. The Examiner deems that these pore sizes would intrinsically represent particle sizes of the polymer dispersions from 100 to 200 nm. The pore sizes of Hamada et al. have a broad range, but a highly transparent porous layer would have a mean pore size of 10 to 350 nm (col. 16, lines 57-62). The sizes of the pores would be directly related to the sizes of the particles and their packing ability. A simple algebraic evaluation of the interstitial area (pore area) of three coplanar adjacent spherical particles led the Examiner to the conclusion that the radius of the particles would intrinsically be 2.2× as big as the diameter of the pore. While only an approximation, it does show that the pore sizes and particles sizes would intrinsically be in the same order of magnitude as each other, and therefore a pore size of 10 to 350 nm would intrinsically comprise a particle size of 100 to 200 nm.

The Examiner has additionally reason to believe that the particle sizes would intrinsically comprise 100 to 200 nm in the transmission of light at 400 nm. As stated by

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applicants in their specification (page 14, lines 1-6), a small particle diameter will lead to less scatter at shorter wavelength regions. Since the porous layer of Hamada et al. is highly transparent at 400 nm, it would lead one to conclude that it must intrinsically be comprised of small particles, including ones of 100 to 200 nm.

With regard to claim 4, since the glossy layer and ink absorbing layer are comprised of the same materials as claimed by applicants, the Examiner deems that the inkjet recording medium of Hamada et al. in view of Watanabe et al. would intrinsically comprise the specular gloss of applicants' claim 4.

With regard to claim 5, the Examiner deems the underlayer of applicants to be a mere duplication of parts. It has been held that "mere duplication of parts has no patentable significance unless a new and unexpected result is produced." Please see MPEP 2144.04 and *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). An underlayer comprised of binder and a pigment would function in the same manner as the ink absorbing layer, and therefore would aid the ink absorbing layer in absorbing ink and color-fastness.

With regard to claim 6, the mole fraction of each of the monomers included in the copolymerized glossy layer is disclosed at col. 14, lines 17-23 of Hamada et al. A mole fraction of from 0.1 to 50 mole% would intrinsically encompass 2 % to 30 % by weight; furthermore, it would have been obvious to vary the weight percentage of all the monomers in order to achieve a porous layer that had the proper amount of water resistance and provided the sharpest images.

With regard to claim 9, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 2 and 3, and therefore it also renders obvious applicants' claim 9.

With regard to claims 10-12, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 2, 3, 4, and 9, and therefore it also renders obvious applicants' claims 10-12.

With regard to claims 13-17, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 2, 3, 4, 5, 9, and 12, and therefore it also renders obvious applicants' claims 13-17.

With regard to claims 18-20, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 3, 4, 5, and 6, and therefore it also renders obvious applicants' claims 18-20.

With regard to claims 7 and 8, these are product-by-process claims. It has been held that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." Please see MPEP 2112 and *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

The Examiner has shown all of the article limitations with regard to these claims in the discussion of claim 1 above; however, the Examiner has not shown that the

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glossy layer has or has not undergone a calendering treatment. The disclosure of Hamada et al. in view of Watanabe et al. discloses drying the porous layer and does not mention a calendering treatment, which therefore means that the disclosures render obvious applicants' claim 8.

With regard to claim 7, calendering by applicants' own admission (page 2, lines 13-27) is a well-known treatment in inkjet recording media to increase the gloss of paper. It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply any type of calendering treatment to improve the gloss of the inkjet recording medium of Hamada et al. in view of Watanabe et al. The results would have been completely predictable to one having ordinary skill in the art of papermaking. With regard to the temperature of the calendering treatment, it would have been obvious to one having ordinary skill in the art to choose any temperature, including the temperature claimed, as long as it was less than the T_g of the thermoplastic latex of the porous layer. If one heated the thermoplastic latex higher than the T_g it would proceed to melt and generate a continuous non-porous film, which would then render the inkjet recording medium unable to absorb ink.

10. Claims 5, 13-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada et al. (6,177,181) in view of Watanabe et al. (WO 00/15552) as applied to claims 1-4, 9, and 12 above, and further in view of Graczyk et al. (6,372,329).

With regard to claims 5 and 13-17, Hamada et al. in view of Watanabe et al. render obvious all of the limitations of applicants' claims 1-4, 9, and 12 in section 11 above. Additionally, they disclose the possibility of an ink-receiving layer of synthetic silica and PVA; however, they fail to include a specific reference to an underlayer comprised of synthetic silica and a hydrophilic binder.

Graczyk et al. disclose an inkjet recording medium comprised of two ink receiving layers that have a slightly different binder composition (please note that both binders are still hydrophilic in nature). The reason for doing this is explained at col. 4, lines 6-19, wherein the bottom layer is designed to quickly absorb ink vehicle fluids while the top layer is designed to absorb ink while preventing pigmented ink cracks from developing in the images; furthermore, the underlayer can be designed to provide good adhesion of the ink-receiving layers to the substrate. Graczyk et al. also disclose at col. 5, lines 10-29 that the ink-receiving layer may be comprised of ink-absorbing pigments, including synthetic silica.

Since Hamada et al. in view of Watanabe et al. and Graczyk et al. are all drawn to inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to introduce the dual ink-receiving layers of Graczyk et al. as an ink absorbing layer and underlayer in the device of Hamada et al. in view of Watanabe et al. The results of such a combination would have been predictable to one having ordinary skill in the art; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing so was mentioned above and includes a dual layer structure that provides for

good adhesion of the ink absorbing layers to the substrate and a structure that quickly absorbs ink vehicle fluids.

With regard to claim 20, the proportion of each of the monomers included in the copolymerized glossy layer is disclosed at col. 14, lines 17-23 of Hamada et al., and includes the range claimed by applicants; furthermore, it would have been obvious to vary each of the proportions of all the monomers in order to achieve a porous layer that had the proper amount of water resistance and provided the sharpest images.

Response to Arguments

11. Applicant's arguments, see Remarks, filed 12/17/2008, with respect to the objections to the specification, the rejection of claims 1-6 and 9-20 under 35 U.S.C. 112, first paragraph, and the rejection of claims 1-20 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The relevant objections/rejections have been withdrawn.

Please note that applicants' amendment has not fixed the objections to the Abstract and the Examiner has suggested language in section 4 above.

Applicants' amendment to the claims has necessitated the new rejection of claims 1-6 and 9-20 under 35 U.S.C. 112, second paragraph.

12. Applicant's arguments filed 12/17/2008 have been fully considered but they are not persuasive.

Applicants first are arguing that the Examiner has not shown a cationic polymer.

The Examiner respectfully disagrees and directs applicants' attention to col. 12, line 50, to col. 13, line 18; specifically, col. 13, lines 6-13 which mentions "nitrogen-containing (or cationic polymers)." The Examiner notes that N,N-diethylaminoethyl (meth)acrylate is an example of a nitrogen containing monomer that could also be in cationic form (i.e. analogous to polydimethylaminoethyl (meth)acrylate hydrochloride at col. 13, lines 10-11); however, it is also noted that applicants list their preferential cationic monomers at page 10, lines 8-19 of their own specification. They list N,N-diethylaminoethyl (meth)acrylate as a cationic monomer (line 9), and it is therefore unclear why applicants are disagreeing with their **own** specification. In either case Hamada et al. disclose cationic monomers.

Applicants also argue that the glossy layer of Hamada et al. will not be in particle form.

The Examiner respectfully disagrees and notes that upon the micelles drying they will intrinsically form polymer particles as claimed, given the fact that they are comprised of identical monomers as claimed. Additionally applicants describe their particles as being "connected in spots" or "in contact" at page 11, lines 8-21. It is unclear how applicants layer is not a network structure when the particles are "connected in spots" or "in contact" with one another. Lastly, the reference describes their network structure as being micelles that will dry and "contact with one another to form a network structure." The Examiner deems that this contact of the reference will be the same contact or connection in spots as the currently claimed invention.

With regard to applicants' reliance on Figures 2-4 of Hamada et al., it is noted that Figures 2-4 of Hamada et al. are of porous layers formed of the compositions of Examples 1 and 7. These examples are not the same composition as applicants' claim 1 and are therefore not an appropriate comparison.

Applicants then argue that one of ordinary skill would not have chosen the four monomers listed in applicants' claim 1.

It has been held that "[w]hen the compound is not specifically named, but instead it is necessary to select portions of teachings within a reference and combine them, e.g., select various substituents from a list of alternatives given for placement at specific sites on a generic chemical formula to arrive at a specific composition, anticipation can only be found if the classes of substituents are sufficiently limited or well delineated. Ex parte A, 17 USPQ2d 1716 (Bd. Pat. App. & Inter. 1990). If one of ordinary skill in the art is able to "at once envisage" the specific compound within the generic chemical formula, the compound is anticipated. One of ordinary skill in the art must be able to draw the structural formula or write the name of each of the compounds included in the generic formula before any of the compounds can be "at once envisaged." One may look to the preferred embodiments to determine which compounds can be anticipated. In re Petering, 301 F.2d 676, 133 USPQ 275 (CCPA 1962)." Please see MPEP 2131.02. Each of the monomer of applicants' polymer particles are clearly disclosed by Hamada et al., and the Examiner has specifically pointed each of them out. It is clear to the Examiner that a copolymer of the abovementioned monomers is also clearly disclosed by Hamada et al.

With regard to applicants' assertion that the Examiner has not properly taught the calendaring steps of applicants' claim 7, the Examiner respectfully disagrees. The Examiner only relied upon applicants' own admission to teach that calendaring does exist and is known to be used upon inkjet recording media. The Examiner could also have taken official notice that calendaring does exist and is known to be used upon inkjet recording media. With regard to the calendaring steps in applicants' claim 7, the Examiner specifically addressed those limitations by stating:

With regard to the temperature of the calendaring treatment, it would have been obvious to one having ordinary skill in the art to choose any temperature, including the temperature claimed, as long as it was less than the T_g of the thermoplastic latex of the porous layer. If one heated the thermoplastic latex higher than the T_g it would proceed to melt and generate a continuous non-porous film, which would then render the inkjet recording medium unable to absorb ink.

The Examiner maintains that it would have been obvious to calendar inkjet recording media to any temperature, including those claimed in order to increase the gloss of said inkjet recording media, while not turning the glossy layer into a fluid mass that could then resolidify into a non-porous film. This would be mere optimization. It has long been an axiom of United States patent law that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003) ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art."); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955) ("[W]here the general

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conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."). "Only if the 'results of optimizing a variable' are 'unexpectedly good' can a patent be obtained for the claimed critical range." *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (quoting *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977)).

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERARD T. HIGGINS whose telephone number is (571)270-3467. The examiner can normally be reached on M-F 9:30am-7pm est. (1st Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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